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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/545,834 | 04/10/2000 | Shuhie Harada | Q58793 | 3167 |

7590 12/19/2001

Sughrue Mion Zinn Macpeak & Seas
2100 Pennsylvania Avenue NW
Washington, DC 20037-3202

EXAMINER

TRAN, LY T

ART UNIT

PAPER NUMBER

2853

DATE MAILED: 12/19/2001

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/545,834

Applicant(s)

HARADA ET AL.

Examiner

Ly T TRAN

Art Unit

2853

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4,5,33-41 and 66-74 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1,4,5,33-37,41 and 66-71 is/are rejected.
- 7) ☒ Claim(s) 38-40 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of species in Paper No. 11 is acknowledged.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 4-5 and 66-74 are rejected under 35 U.S.C. 102(b) as being anticipated by Terasawa et al. (USPN 5,126,766).

With respect to claims 1, 5 and 66 and 69, Terasawa et al. discloses an apparatus and a method of:

- An ink jet recording head having nozzle orifices from which inkdrops are ejected (Column 4: line 24-25);
- An ink storage unit for storing ink to be supplied to the recording head (Column 4: line 22-24);
- An ink flow passage communicating the ink storage unit and the recording head (Fig. 1: element 60);
- A valve unit for opening/closing the ink flow passage ((Fig. 1: element 52);

- A capping unit for sealing the nozzle orifices (Fig.1: element 21);
- A suction pump for reducing pressure (Fig.1: element 20);
- A control unit for controlling the valve unit, the capping unit and the suction pump unit (Fig1: element 56) such that: the valve unit closes the ink flow passage, the capping unit seals the nozzle orifice, the suction pump decompresses the internal space of the capping unit and the valve unit opens the ink flow passage a predetermined time period elapses (Column 6: line 3-19, Fig. 8E);
- The suction pump continues decompressing the internal space of the capping unit for a second predetermined time period (Fig.6C+6D);

With respect to claims 4 and 68, Terasawa et al. discloses an apparatus and a method of wherein the predetermined time period is defined as either a time period required for obtaining a satisfactory deaeration degree of ink between the valve unit and the nozzle orifice (Column 2: line 3-10, Fig. 6A-6H, Fig 8A-8J).

With respect to claims 67 and 70, Terasawa et al. discloses a control method wherein the sealing step and the closing step are executed synchronously (Column 6: line 3-6).

With respect to claim 71, Terasawa et al. discloses the step of stopping to drive the suction pump after a second predetermined time period has elapsed since the ink flow passage was opened (Fig.6C-6D).

With respect to claim 72, Terasawa et al. discloses the step of driving the suction pump between the sealing step and the closing step (Fig.6C-6E).

With respect to claim 73, Terasawa et al. discloses the step of driving the suction pump again after the stopping step has executed (Fig.6D).

With respect to claim 74, Terasawa et al. discloses step of resleasing the capping unit from the nozzle orifices after the suction pump has driven again and driving the suction pump again to discharge ink from the nozzle orifices in a capping released state (Fig.6D-6E).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 33-37 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Terasawa et al. (USPN 5,126,766) in view of Wu et al. (USPN 5,851,004).

Terasawa et al. teaches an apparatus of a valve unit for opening/closing.

However, Terasawa et al. fails to teach a valve control chamber, a flexible diaphragm, an actuation body, valve control chamber has an entrance port formed on a top wall thereof at a portion where is away from the center portion of the diaphragm and an exit port formed on the top wall, the entrance port is arranged below the exit port, the

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circumferential portion of the exit port is tapered, the diaphragm includes an annular convex portion and the actuation body is a rod member.

Wu et al. teaches a valve control chamber (fig.1: element 20), a flexible diaphragm (Fig.3: element 40), an actuation body (Fig.1: element 74+78), valve control chamber has an entrance port formed on a top wall thereof at a portion where is away from the center portion of the diaphragm and an exit port formed on the top wall (Fig.1), the entrance port is arranged below the exit port (Fig.1), the circumferential portion of the exit port is tapered (Fig. 2), the diaphragm includes an annular convex portion (Fig. 2: element 48) and the actuation body is a rod member (Fig. 1: element 70+74).

It would have been obvious to one having ordinary skill in the art to have a valve control chamber, a flexible diaphragm, an actuation body the diaphragm includes an annular convex portion as taught by Wu et al in the invention of Terasawa et al. The motivation of doing so in order to achieves affective sealing of high pressure gas (Wu et al., Column 3: line 37-55)

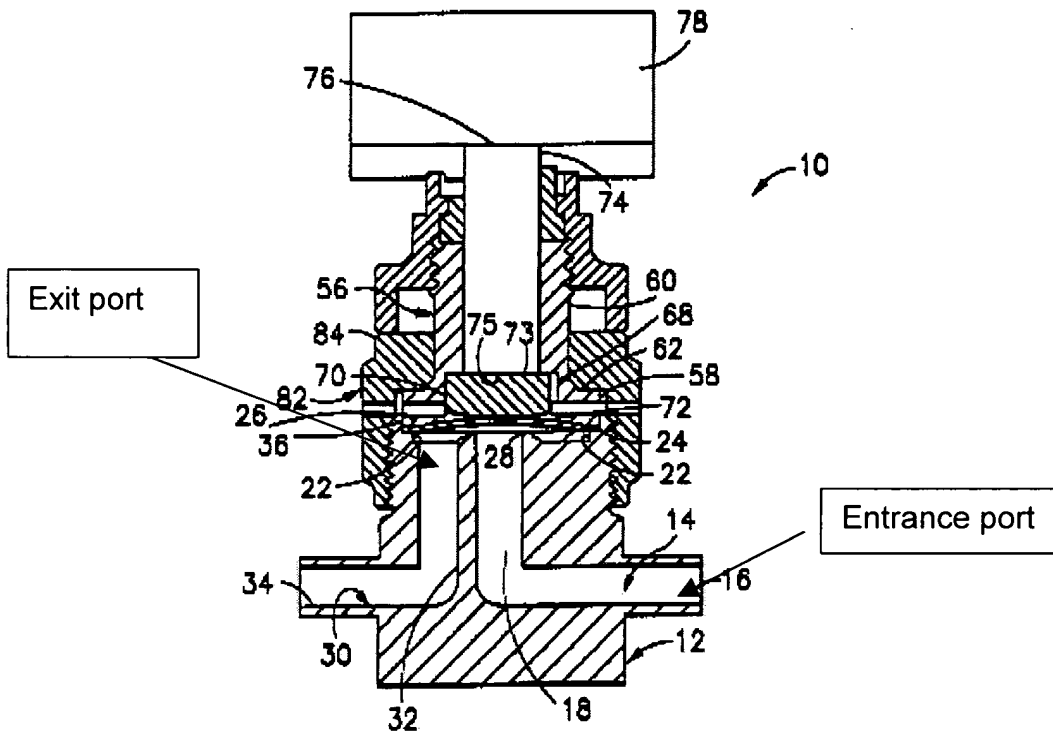


FIG. 1

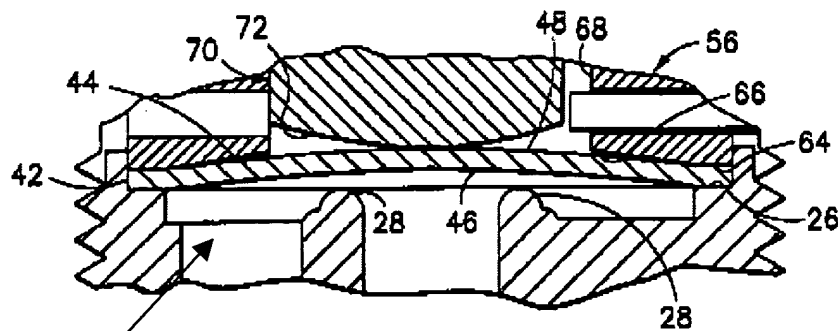


FIG. 2

Exit port is tapered (larger on the top and smaller on the bottom)

Allowable Subject Matter

4. Claims 38-40 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 38 and 39 appear to be allowable over the prior art of record because at least prior art has not been found to anticipate an outer peripheral wall of the groove is tapered such that a diameter of thereof is reduced toward the above.

Claim 40 appears to be allowable over the prior art of record because at least prior art has not been found to anticipate a cross sectional area of the ink flow passage between the exit port and the recording head becomes larger as further from the exit port.

Conclusion

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Ly T. Tran whose telephone number is (703)-308-0752. The examiner can normally be reached on Monday-Friday (7:15-5:00).

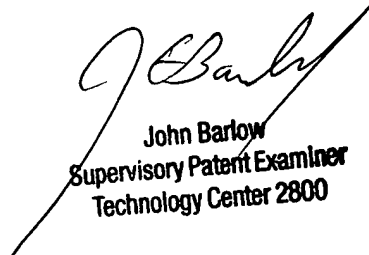
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (703) 308-3126. The fax numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

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Any inquire of a nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

lt

December 6, 2001


John Barlow
Supervisory Patent Examiner
Technology Center 2800